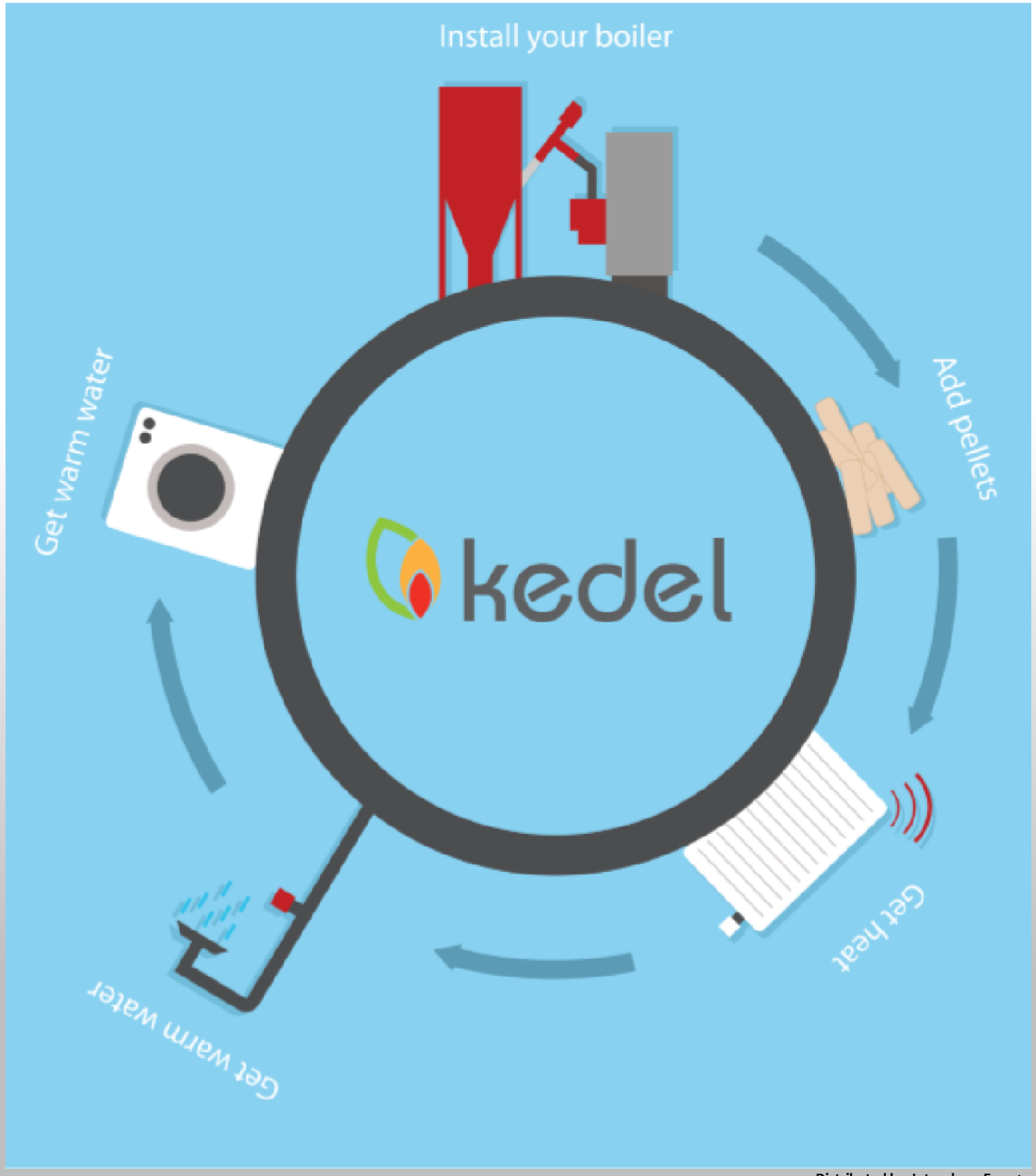
kedel pellet boilers | The answer is simple.

Installation, Operation & Maintenance Manual



EN303-5, UL391, UL2523, CSA336.1, ETLM 78-1

Distributed by: Interphase Energy
145 Presumpscot St.
Portland, ME 04103
207.370.2690

Table of Contents

Dear Customer.

Thank you for purchasing this NBE product which is designed and manufactured to the highest standards in the EU; and distributed in North America by Interphase Energy, LLC. In order for you to get the most out of your product, we strongly recommend that you carefully read this manual prior to installation and operation. In the event that you encounter any difficulties during installation or operation, we recommend that you first refer to this manual or the information provided in the support section on www.nbe.dk or www.nbe-global.com.

Note: Help text on all menu items are displayed in the controller and therefore are not described here in this manual. It is recommended to study the menus prior to initial start.

Some menu parameters can only be visible after going to the **Extended Setup** menu in the controller and enabling the **Technical Setup** to **Yes.** This will allow you to make changes to the hidden menus for a 30 minute period.

Save this manual, so you always have it available if you ever need it.

Warnings

Never handle the auger, blower, nor should you crawl in the hopper when the system is powered. There will be no warning prior to the activation of these components. The boiler must not be operated without the shield on the burner.

The system is provided with an electrical current of 110V/60Hz.
An improper installation or improper repair can cause life-threatening electrical shock. Electrical connections must be performed by the person who has the right skills and training. Performance of electrical installation must be carried out in COMPLIANCE with local/state code requirements.

Always disconnect the system from the electrical supply prior to starting maintenance work or servicing. The system must be connected to a separate electrical circuit, which is equipped with the proper circuit breaker and earth leakage breaker (grounding).

The boiler must be mounted to a functioning chimney. In the event that you smell smoke or see any other indication of improper draft of the chimney, all operation of your system must cease immediately and must remain so until a solution to the draft problem has been resolved. Continuing operation may result in death or injury.

Always read the manual before installing and/or repairing of the system.
If in doubt, seek professional help.

Open top covers etc.. with extreme caution.
When the boiler is in operation, there is a risk of high temperature below the top covers, which can cause burns.
Avoid handling the boiler while it is in operation.
Never open the ash tray while the boiler is in operation.

The system must be operated by skilled individuals.
If you are in doubt as to the safe operational use of the boiler, contact your dealer.

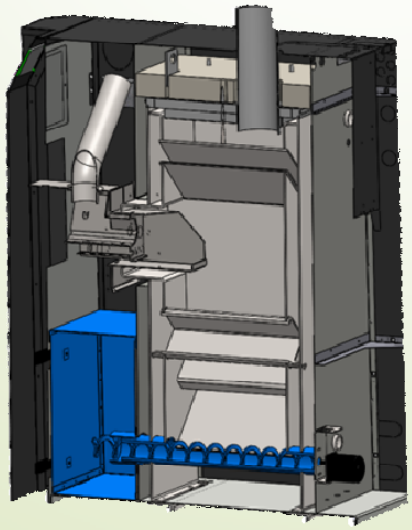
The menu structure etc. for the controller is supported by the help texts found in the control box itself. Due to constant updates and new features, the menu structure of the controller will not be described here in this manual.
Instead, it is recommended to browse the controller thoroughly prior to use and to receive an overview of all functions, etc. by your installer.

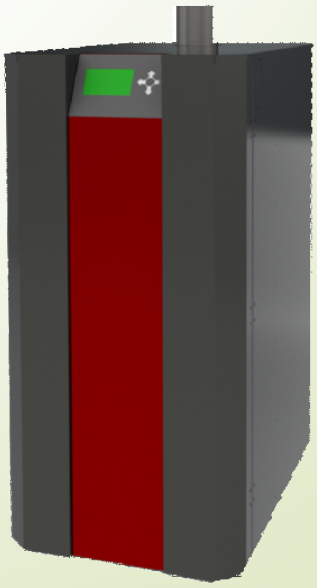
This manual must be kept at the boiler!

Boiler Specifications

Product Name	RTB 16	RTB 16 Vac	RTB 30	RTB 30 Vac	RTB 50	RTB 50 Vac
Nominal Performance	17 kW	17 kW	30 kW	30kW	45kW	45kW
Nominal Efficiency	91,1%	91,1%	91,4%	91,4%	>90%**	>90**
Minimum Efficiency	92,4%	92,4%	92,7%	92,7%	>90%**	>90%**
Power Consumption (Nominal)	40W	40W	90W	90W		
Power Consumption (Minimum)	20W	20W	34W	34W		
EN303-5:2012 Class	5	5	5	5	5	5
Controller Version:	V7	V7	V7	V7	V7	V7
Width (in.) (only boiler)	20	20	24 ½	24 ½	28 ½	28 ½
Depth (in.)	33 ¼	33 ¼	33 ¼	33 ¼	41	41
Height (mm)	40 ¼	72 *	40 ¼	72 *	48 ¼	72*
Chimney Diameter (in.)	4	4	4	4	5	5
Weight (lbs.)	357	428	395	472	551	655
Water Volume (gal.)	9.5	9.5	12.7	12.7	20.6	20.6
Ash Can (gal.)	8.2	8.2	10	10	15.9	15.9
Forward/Return/Filling	¾ "	¾ "	¾ "	¾"	1"	1"
Test # : 300-ELAB-	2045	2045	2064	2064	n/a	n/a

** coming soon
* Height with Vac Hopper





Burner Specifications

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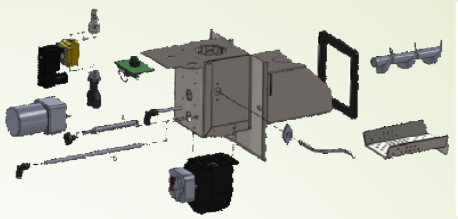
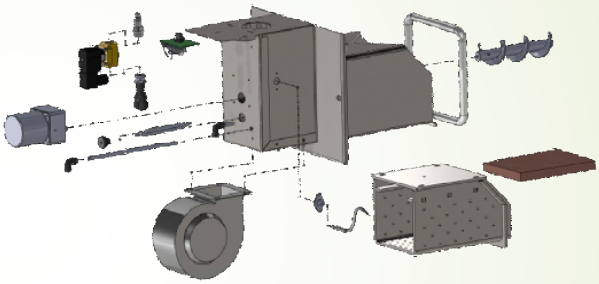
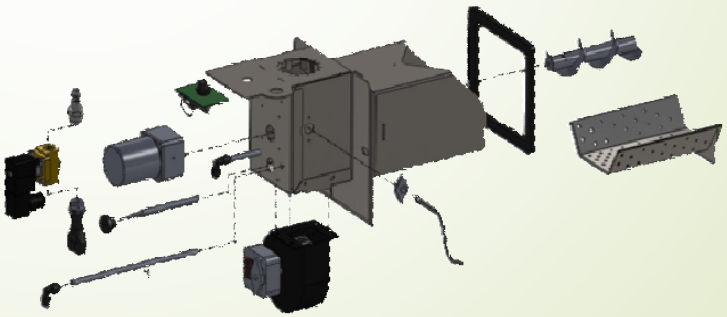
16-24kW burner:
Up to 243 lbs./day
40 watt/hour
Weight 26 lbs.



30kW burner:
Up to 331 lbs./day
45 watt/hour
Weight 33 lbs.

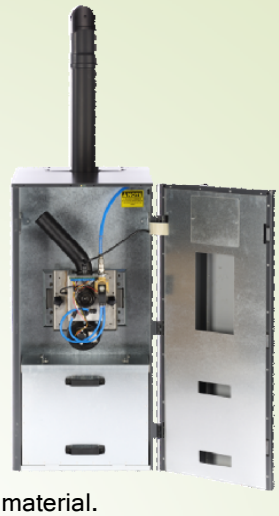


40kW burner:
Up to 441 lb.s/day
60 watt/hour
Weight 66 lbs.



Boiler Room Design

The boiler room for biomass boilers must be installed in accordance with the rules set forth by your local building codes, environmental authorities, and labor inspectorate. If you are in doubt on how to set up your boiler room, we recommend that you contact your local certified RTB dealer for guidance.



1. **Wall and Ceiling**
2. **Distance to the Wall**
3. **Floor**
4. **Area and Lighting**
5. **Chimney**
6. **Air**
7. **Water Faucet**
8. **Fuel**
9. **Prohibited Liquids and Materials in Boiler Room.**
10. **Permit, Notification and Inspection.**

1. **Wall and Ceiling**

Ceiling surfaces must be constructed with at least Class 1 surface material.

If the ceiling surface happens to be the underside of the roof, the material must be made of non-combustible materials. Wall surfaces must be constructed of at least a Class 2 surface material.

2. Distance to the Wall

Distance from the boiler or flue pipe to any combustible material should be large enough of a distance to prevent temperatures from reaching an excess of 180° F. This requirement applies even if the combustible material is covered with non-flammable material. If the distance is greater than 18", the distance requirement is typically satisfied.

3. Floor

Floors should consist of (or be covered with) non-combustible material under and around the boiler of a distance of at least 12" from the boiler sides, and 18" from the boiler's front (i.e. the side where the ash is removed).

4. Area and Lighting

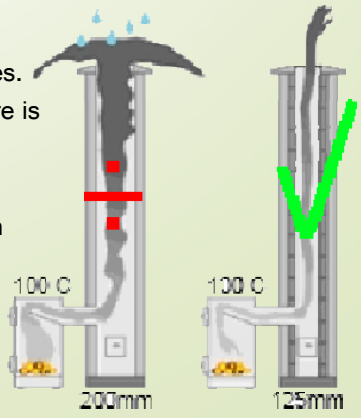
The boiler room and area around the heating system must be large enough to allow for easy operation, cleaning, and maintenance of the heating system and boiler room.

There must be adequate lighting so that operation and maintenance can be performed safely.

5. Chimney

The chimney must be of a design, aperture area, and height that provides adequate draft conditions for the proper exiting of flue gasses. The height of the chimney must also be controlled to ensure that there is sufficient draft for chimney smoke to exit.

The chimney draft is created by negative pressure resulting from hot smoke that is buoyant; thus causing the smoke to rise up through the chimney. WARNING: *If there is not enough draft in the chimney, the smoke will not properly rise and will instead seep out through small cracks; causing toxic smoke to seep into the house.*



Boiler Room Design

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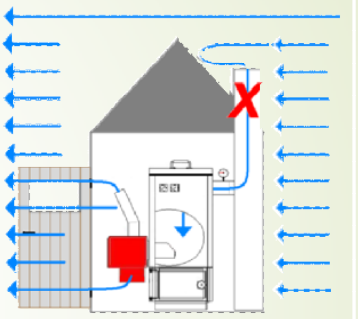
The internal diameter of the chimney must be sufficient enough for the amount of flue gases the chimney has to lead away. If the internal diameter is too small, this will prevent the smoke from exiting fast enough due to the large resistance in the chimney. This could cause the smoke to turn back; thus allowing for toxic fumes to enter into the house. Simultaneously, the pellet fuel may not be completely burned, due to the lack of oxygen for combustion. This can cause traces of tar like soot to sit in the chimney and create what is called creosote, which increases the risk of chimney fire.

The chimney opening must also not be too large since cold air can enter the chimney from the top. When the chimney becomes cooled, condensation can occur and develop soot inside the chimney. Soot is mostly a cosmetic problem, because it can penetrate through the chimney and cause ugly brown splotches to appear on the walls inside the house.

In addition, it is important that the chimney protrudes high enough above the roof so the smoke does not bother the surrounding houses. Environmental authorities have the possibility of prosecution if there are neighbors that complain about the smoke or odor.

What signs are there, if the chimney is not working?

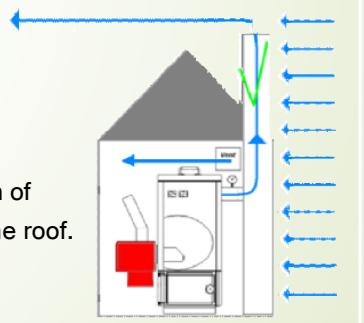
- Light sensor is sooty or melted.
- Smoke in the hopper.
- Warm drop shaft.
- Smoke billows out of the fan or boiler during startup.



If you have any problems with your chimney, it is a good idea to keep a "diary" of any draft problem; as draft problems are often associated with wind in certain directions.

Wind blowing on one side of the house can cause under pressure on the other side of the house.

Overpressure and under pressure will try to balance out- even through a chimney if possible. It is a good idea to ask your chimney sweeper about the size of the chimney and flues, the location of chimney cleaning doors, and whether it is required to have steps on the roof. He will also perform a fire prevention inspection.



6. Air.

The pellet boiler should be able to get enough air for combustion. This can be achieved if the pellet boiler is installed in a room which is equipped with a sliding window with an adjustment bracket, an adjustable air vent from the outside, or by providing combustion chamber air through a duct from the outside. The area amount of the fresh air valve should generally be the same as the internal diameter of the chimney. It should also be mounted on the same side as the chimney to compensate for any pressure differences.

Note: that drum dryers, range hoods, or oil burner in the same room, all use high pressure blowers, that steal the air in the room!

7. Water tap.

There must be a tap in the boiler room.

If the boiler output is less than 60 kW, a powder extinguisher can do it. (at least 10 lbs.)

Boiler Room Design

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8. Wood pellet

The pellets must be pure wood, ¼" diameter, max 8% water.

Materials with glue, paint, wood paint or plastics shall not be burned.

If the fuel storage is greater than 25 ft.3, the boiler system and fuel storage must be located in a separate fire cell with at least one BD30 door to the other room.

If the fuel storage or hopper is placed in the open or under a shelter, there may be minimum distances to the building that should be observed. Exposed fuel may not be in the boiler room, except logs.

Do not exceed 186 ft.3 fuel in the boiler room, including fuel storage and usage storage.

9. Prohibited liquids and materials in boiler room

The boiler room must be kept clean and contain no combustible materials nor flammable liquids (except oil for oil burners).

The floor must be kept free of spilled fuel, dust and combustible waste as well as waste from other activities in the room. Any burning embers must be extinguished with water and transported to a secure storage location in the open.

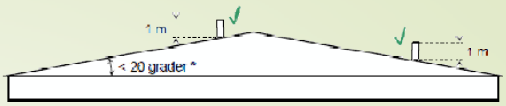
Requirements for Chimney Heights

Statutory air pollution requirements for solid fuel boilers up to 1MW.
(Only applicable for newly-built chimneys.)

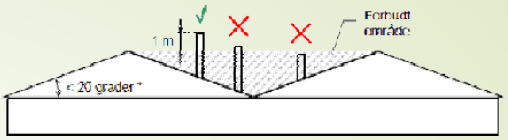
9

Buildings with a roof slope that is less than 20 degrees.

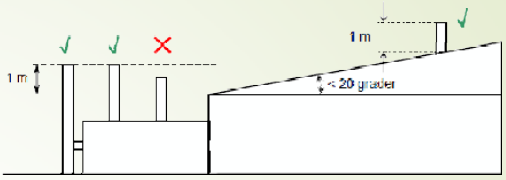
Roofs with a slope of less than 20 degrees is counted as flat.



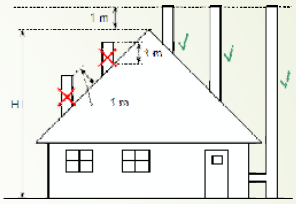
Buildings with a double roof and roof slope that is less than 20 degrees.



Buildings with a roof slope that is less than 20 degrees and is adjacent to another building.

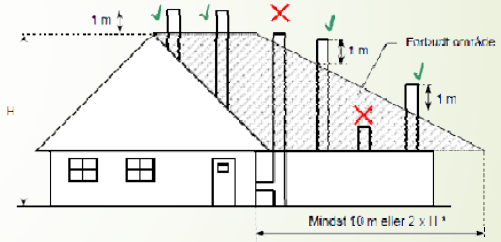


Buildings with a slope greater than 20 degrees.



Buildings with a slope greater than 20 degrees and has an adjacent building with a flat roof.

∗ Highest value selected.

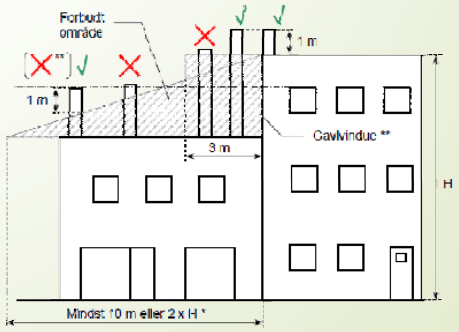


* Højeste værdi vælges

Property block or industrial building with an adjacent building.

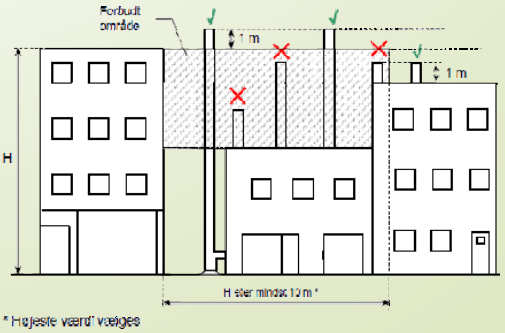
∗ Highest value selected.

∗∗ At gable windows, the chimney must be at least 1 m above the gable window's upper corner.



Property block or industrial building with two adjacent buildings.

∗ Highest value selected.

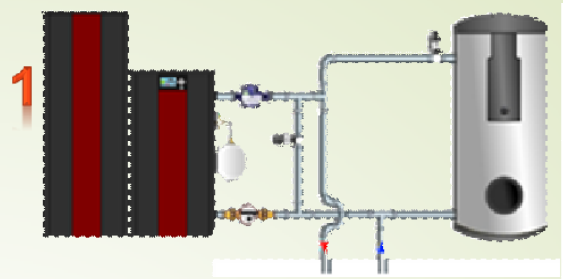


* Højeste værdi vælges

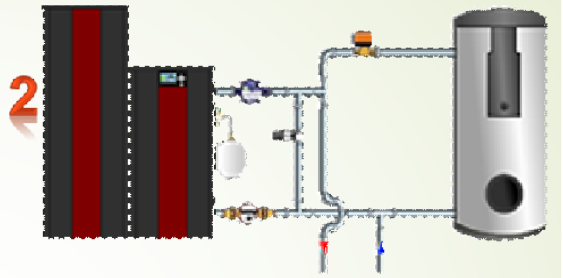
Installation of the Boiler

A properly executed installation ensures that the system functions properly.
Both national/local guidelines and requirements must always be observed.
The boiler can be installed on a pressurized system up to max 2.5 bar.

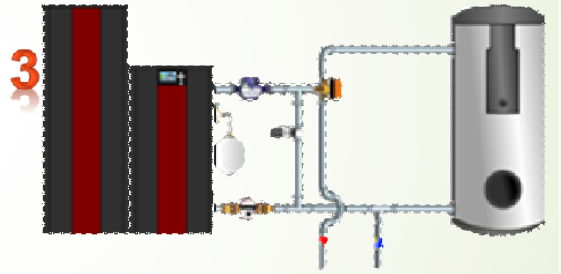
1. Standard.
DHW with mechanical flow control.



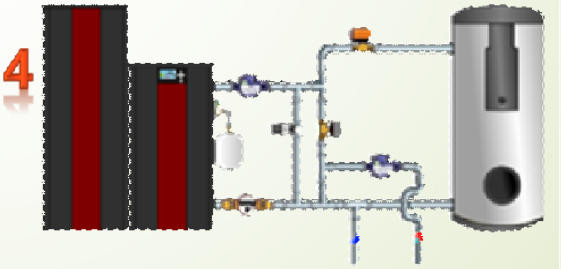
2. DHW with 2 way valve.
Typically used when DHW is small
or when the surface coil is small.
Heat for the house is supplied while
hot water is being produced.



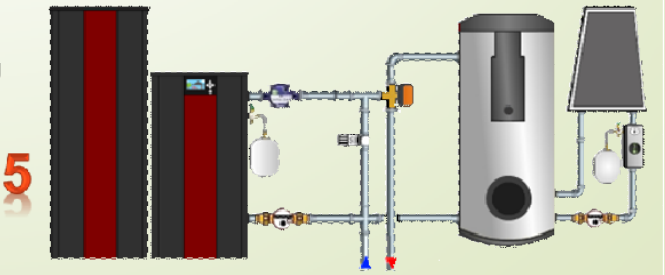
3. DHW with 3 way valve.
Typically used when the water heater is large,
and when the surface coil is large
The house is not supplied with heat
while producing hot water. The house must
therefore be able to manage without heat
for short periods during the winter .



4. Weather compensation.
Allows you to have a high temperature
on the boiler as well as manage the supply
temperature to the house in relationship to
the outside temperature and chill factor.



5. Weather compensation and solar heating



Installation of the Boiler

General Guidelines:

1. The boiler should only be installed by qualified installers with a ***"Certificate for installation and service of small biofuel plant"*** and must be installed according to AT guidance on technical equipment - B.4.8 (only applicable in DK)

2. The boiler must **not** be installed on combustible surfaces.

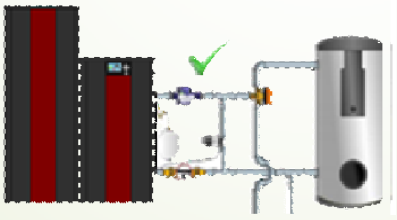
3. The chimney pipe over the boiler must be installed with a cleanout door and must be 20" in length above the boiler as to allow for easy dismounting of the controller cassette located at the back of the boiler. Install in a 90 degree chimney bend if necessary.

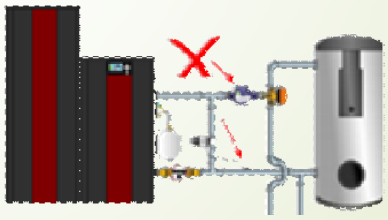
4. Chimney draft should be a **minimum** 5 PA and be stable. Overpressure must **not** occur. It is required to install a draft stabilizer.

Draft stabilizer

5. The boiler must be installed with an approved shunt.
Note: You may lose your warranty if failing to install an approved shunt with your system.

Approved mixing valve





RTB Pellet Hoppers

More pellet hopper solutions can be found at www.nbe-global.com .
All hoppers can be used for the vacuum transporting of pellets to the hopper.

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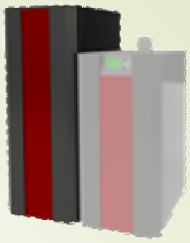
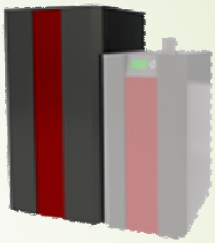
220kg:

Hopper Width	20 in.
Width (Boiler+ Hopper)	40 in. (RTB 54) 44 ½ in. (RTB 102)
Height	51 ¼ in.
Depth	33 ¼ in.
Pellet Capacity	485 lbs.
Compatible with RTB sizes:	10,16,& 30 kW



320kg:

Hopper Width	27 ½ in.
Width (Boiler+ Hopper)	31 ¾ in. (RTB 54) 36 ¼ in. (RTB 102)
Height	51 ¼ in.
Depth	33 ¼ in.
Pellet Capacity	705 lbs.
Compatible with RTB sizes:	10,16,& 30 kW



VAC10/16:

Hopper Width	20 in.
Width (Boiler+ Hopper)	24 ¾ in.
Height	72 in.
Depth	33 ¼ in.
Pellet Capacity	110 lbs.
Compatible with RTB sizes:	10 & 16 kW
Vacuum Transport is included.	

VAC30:

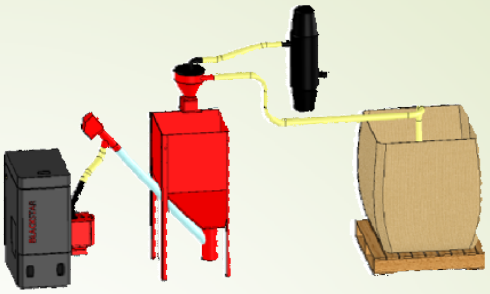
Hopper Width	24 ¾ in.
Width (Boiler+ Hopper)	24 ¾ in.
Height	72 in.
Depth	33 ¼ in.
Pellet Capacity	155 lbs.
Compatible with RTB sizes:	30 kW
Vacuum Transport is inculded.	

Vacuum Transport

The Vacuum System for wood pellets makes it easy to customize various delivery forms for your system. Here are a few examples of ways to configure your vacuum transport:

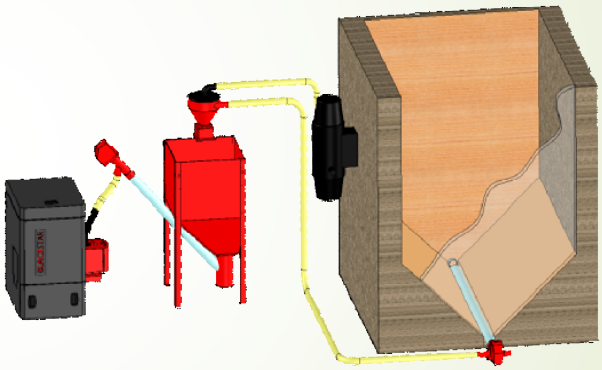
Big bag

Throw the mole in the bag.
Easy way to transport 1 ton.



V bottom hopper:

Transports pellets via a bottom auger.
A stable and secure way to transport pellets, but requires more headroom.



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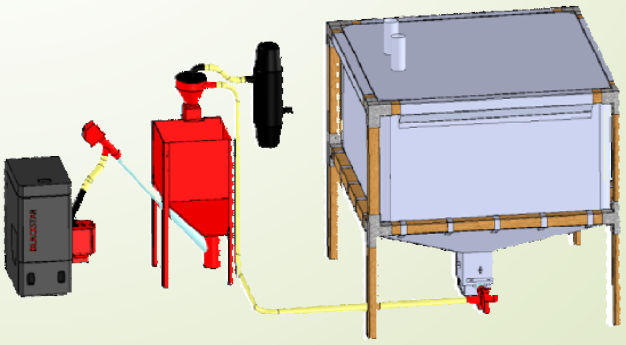
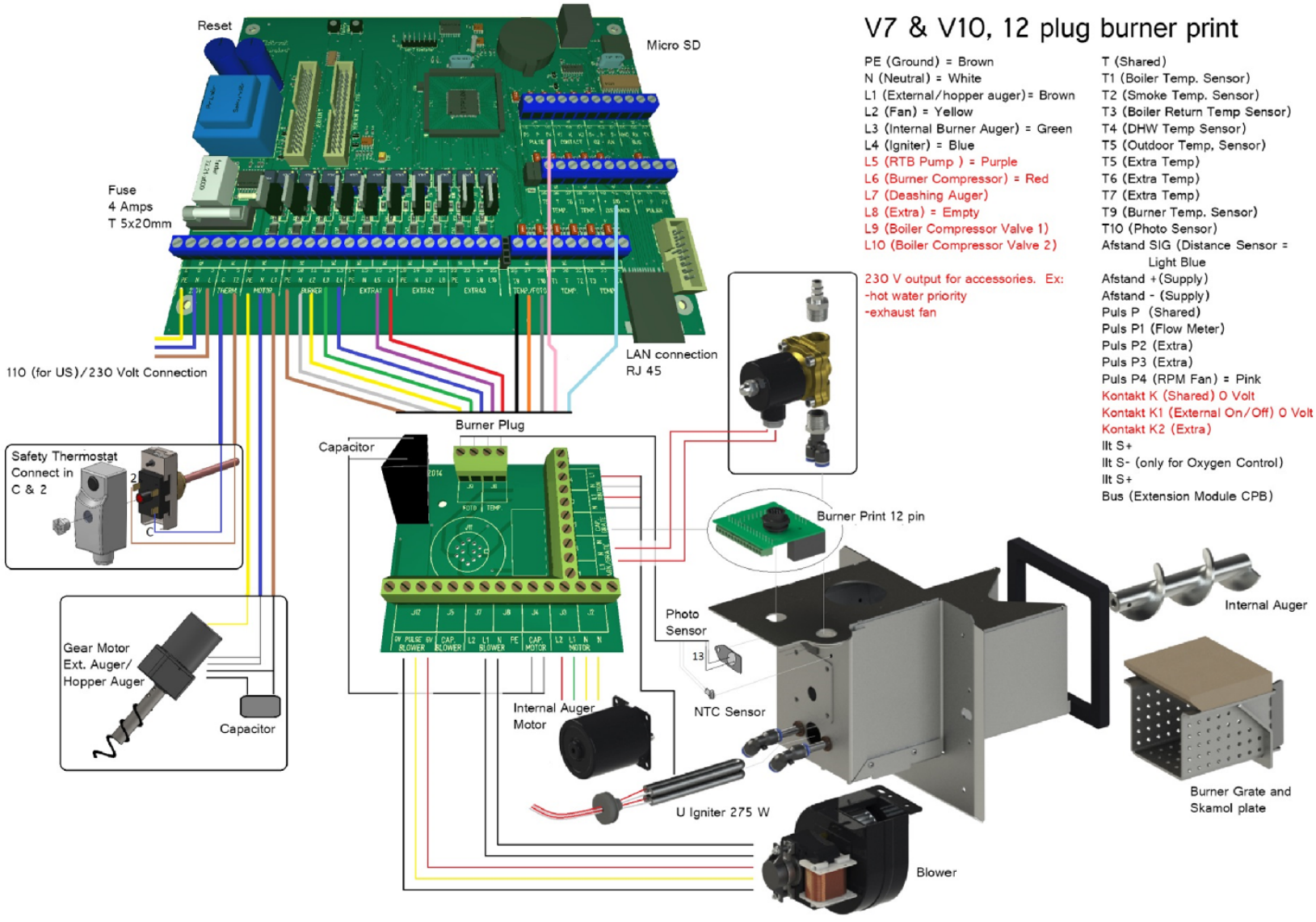
Fabric hopper:

An inexpensive bulk hopper solution.



V7 & V10, 12 plug burner print



PE (Ground) = Brown
N (Neutral) = White
L1 (External/hopper auger)= Brown
L2 (Fan) = Yellow
L3 (Internal Burner Auger) = Green
L4 (Igniter) = Blue
L5 (RTB Pump) = Purple
L6 (Burner Compressor) = Red
L7 (Deashing Auger)
L8 (Extra) = Empty
L9 (Boiler Compressor Valve 1)
L10 (Boiler Compressor Valve 2)

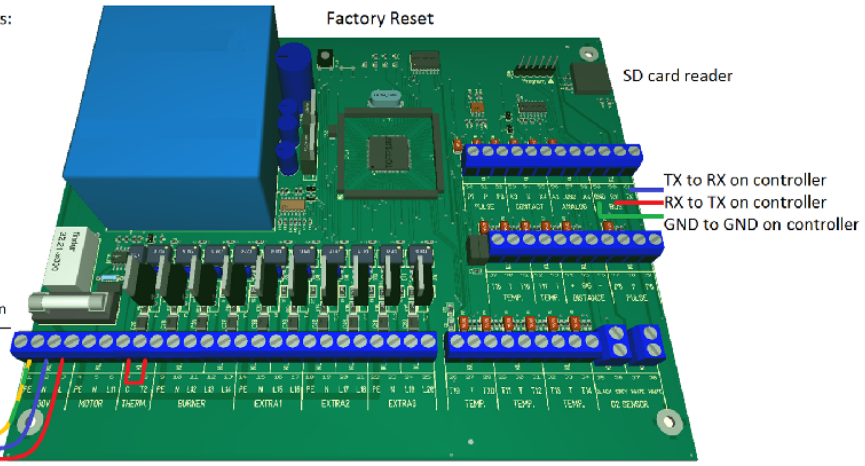
230 V output for accessories. Ex:
-hot water priority
-exhaust fan

T (Shared)
T1 (Boiler Temp. Sensor)
T2 (Smoke Temp. Sensor)
T3 (Boiler Return Temp Sensor)
T4 (DHW Temp Sensor)
T5 (Outdoor Temp, Sensor)
T5 (Extra Temp)
T6 (Extra Temp)
T7 (Extra Temp)
T9 (Burner Temp. Sensor)
T10 (Photo Sensor)
Afstand SIG (Distance Sensor = Light Blue
Afstand +(Supply)
Afstand - (Supply)
Puls P (Shared)
Puls P1 (Flow Meter)
Puls P2 (Extra)
Puls P3 (Extra)
Puls P4 (RPM Fan) = Pink
Kontakt K (Shared) 0 Volt
Kontakt K1 (External On/Off) 0 Volt
Kontakt K2 (Extra)
Ilt S+
Ilt S- (only for Oxygen Control)
Ilt S+
Bus (Extension Module CPB)

EXT. module for V. 7 and 10 controller.

By adding more in and outputs,
optional equipment can be added as:

Vacuum transport.
Compressor cleaning.
O_2 controller.
Hot water priority kit.
Solar heating.
Exhaust fan.
Weather compensation.
Distance sensor.
And more.



1. PE. GND.
2. N. Power supply 230/110 Volt.
3. L. Power supply 230/110 Volt.

Output's:
4. PE GND.
5. N. Out.
6. L 11. Out.

7.] Connected.
8.]

9. PE GND.
10. N. Out.
11. L 12. Out.
12. L 13. Out.
13. L 14. Out.
14. PE GND.
15. N. Out.
16. L 15. Out.
17. L 16. Out.
18. PE GND.
19. N. Out.
20. L 17. Out.
21. L18. Out.
22. PE GND.
23. N. Out.
24. L 19. Out.
25. L 20. Out.

Input's:
26. Temp. 19 input.
27. Temp. common.
28. Temp. 20 input.
29. Temp. 11 input.
30. Temp. common.
31. Temp. 12 input.
32. Temp. 13 input.
33. Temp common.
34. Temp. 14 input.

35. Lambda sensor Black.
36. Lambda sensor Grey.
37. Lambda sensor White.
38. Lambda sensor White.

39. Temp. 15 input.
40. Temp. common.
41. Temp. 16 input.
42. Temp. 17 input.
43. Temp. common.
44. Distance.
45. Distance common.
46. Distance.

Input's:
47. Pulse 5.
48. Pulse common.
49. Pulse 6.
50. Pulse 7.
51. Pulse common.
52. Pulse 8.
53. Contact 3.
54. Contact common.
55. Contact 4.
56. Analog 3.
57. Analog common.
58. Analog 4.

59. Bus GND. to Bus GND.
60. Bus RX. to TX.
61. Bus TX. to RX.
Communication to controller.

Requires from version 7.05 and 10.48 and up.
Installation:

Disconnect power supply to the controller.
Place the ext. module next to the controller.
Connect GND/RX/TX (Bus) to controller.
Notice RX/TX to be crossed.
Connect optional equipment, if any.
Connect module to power supply.

Turn on power to controller and ext. module.

In the controller go to menu 19, Extended setup.
Select the following:
Technical Setup = YES

Expansion module connected = YES

If the controller is connected to an expansion module, it will always read the oxygen level in the expansion module.
If the controller is not connected to an expansion module, it will read the oxygen level in the controller's input "O2"

If the controller is connected to an expansion module, it will read the distance sensor from either the controller input "DISTANCE" or from the expansion module's input "DISTANCE", depending on where the signal is strongest.

There are some lights in the expansion module:
Green light (Power) when the power is on.
Red light (ERROR) if there is no communication.
Yellow light (communication) if there is communication with a controller print.
Blue light (SD-card is being read) is on, while loading the program from the SD-card. When loading is complete, the blue light will switch off again.

Electrical Connection Table:

Overview of connectivity.

	IN	OUT	
230	PE-N-L		110Volt AC
SAFETY THERMOSTAT	L-L		Safety thermostat cutoff
MOTOR		PE-N-L1	External auger
BRÆNDER		PE-N-L2	Fan
BRÆNDER		PE-N-L3	Internal auger
BRÆNDER		PE-N-L4	Ignition
EKSTRA 1		PE-N-L5	Circulation pump, can be set to other equipment.
EKSTRA 1		PE-N-L6	Compressor cleaning, can be set to other equipment.
EKSTRA 2		PE-N-L7	De-ashing Auger.
EKSTRA 2		PE-N-L8	Optional output for equipment.
EKSTRA 3		PE-N-L9	Boiler Compressor Valve 1
EKSTRA 3		PE-N-L10	Boiler Compressor Valve 2
BUS	GRD, TX, RX,		Expansion module
ILT	V1, V, V2		O2 controller
KONTAKT	K-K1		External ON/OFF
KONTAKT	K-K2		Free
PULS	P-P1		Flow meter system
PULS	P-P2		Flow meter solar heating
PULS	P-P3		Free
PULS	P-P4		Fan RPM
AFSTAND	-, SIG, +		Distance sensor for hopper
LAN	RJ45		Internet connection
TEMP.	T- T1		Boiler temperature
TEMP.	T – T2		Smoke temperature
TEMP.	T – T3		Boiler return temperature
TEMP.	T – T4		DHW temperature
TEMP.	T – T5		External temperature
TEMP.	T – T6		Free
TEMP.	T – T7		Free
EKS / FOTO	T – T9		Temperature sensor burner
EKS / FOTO	T-T10		Photo sensor burner

Optional Equipment:

Aids in performing adjustments, cleaning, and knowledge.
The controller supports the following equipment:

Extension Module:
Get 10 extra outputs and inputs for all your accessories. Inbuilt with O_2 control print board.

Lambda Sensor:
For extension module.

INCLUDED WITH RTB
Smoke temp. sensor:
Reads the current smoke temperature in the display.

External temp. sensor:
Stops burner through an external temperature sensor.

O_2 control kit:
Regulates the amount of oxygen in the flue gas. Regulates the quantity of wood pellet and air according to the desired O_2%.

Flow sensor kit:
Read the system flow in the display and calculates the current power consumption for the house.

Hot Water Priority kit:
Produces hot water only when it is needed. Closes hot water tank, when the house is heated. Kits available with either 2 or 3 way motorized valve.

Distance sensor for hopper:
See how much is left in the hopper and displays it on the controller screen.

INCLUDED Compressor Cleaning System: Cleans the burner head efficiently with high pressure. With this kit you need to use your own compressor.

Exhaust fan:
Need greater chimney draft? The fan's RPM can be synched with the burner's power output.Can be connected to the burner controller.

INCLUDED WITH RTB
Compressor :
Clean the burner head efficiently with high pressure. With "low noise" compressor.

Weather compensating:
Maintains a high boiler temperature and adjusts the house inlet temperature in relation to the outdoor temperature.

Solar heating
Use the pellet burner controller to run your solar system.

Wireless thermostat:
Stops the pellet burner with thermostat.
Gives a smooth transition to summer time.

Connecting to the Stoker Cloud

The controller for the RTB is a web-enabled controller and can be updated automatically from the Internet.
Operational data on your system can be viewed on www.stokercloud.dk

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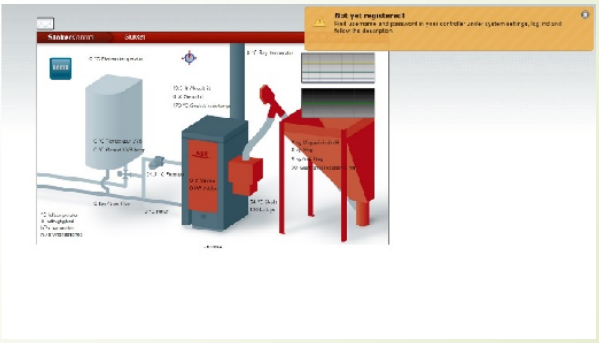
How to get the controller on the web:

1. Connect the controller to your router through an RJ45 cable, as it is a direct cable connection, there is no password, etc..
   Once the controller is connected a small icon will appear on the controller screen.

2. Find your control serial number(username) and password in the controller under the menu “System."

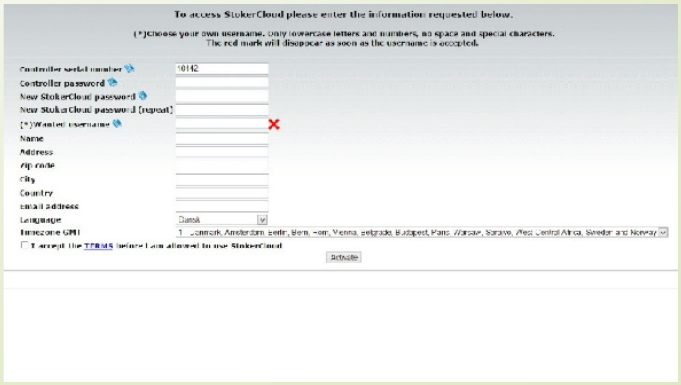
3. Go to www.stokercloud.dk and find your controller serial number in the scroll-down at the top of the page or type your control number in the search box.

4. Press LOGIN, and enter controller’s serial number and password.

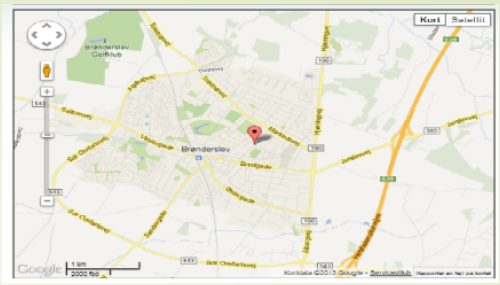


5. Enter your information.
   New user name
   New password

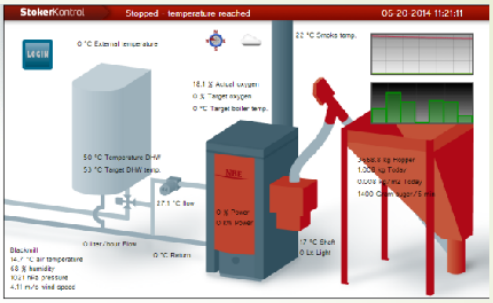
   Note: verify Language and Time Zone



6. Stokercloud.dk will display the location of your system via a drop pin on the stokercloud map. If you do not want others to see the exact location of your system simply move the drop pin a little.



7. Once your configuration are saved, you will now have your own webpage and system dashboard on Stoker Cloud. After a short period of time you should see data streaming from the burner.



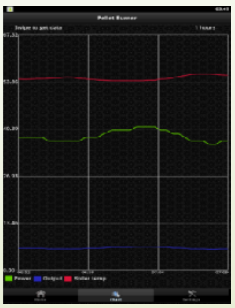
Do you want data on your mobile device?

Then download our App for the following devices:

For android mobile phone search "StokerKontrol"

For iPhone mobile phone search "StokerApp"

For Windows Mobile phone search "Stokerkontrol"

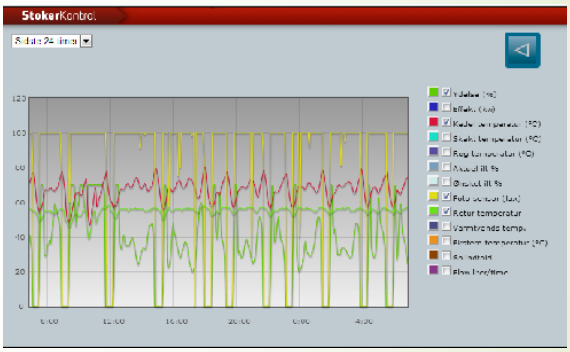


Cloud Service

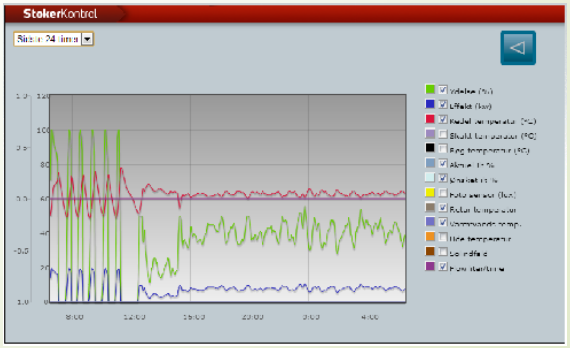
If your burner is registered online via our website www.stokercloud.dk
we can help keep an eye on your system. If something unexpected happens, such as too many ignitions, unstable operation, improper PI regulation etc..
then we have the opportunity to help you ONLINE.

How it works:

- If your system is online, Kedel technicians can observe abnormalities on your system. If necessary, one may contact you by e-mail and ask your permission to make operational changes. If permission is granted to them, they will monitor your system's operational graphs and burner reaction pattern, and make adjustments based on the observations. Changes to your settings can always be viewed via your system LOG.



- After adjusting, it should look like this ...



NBE's Cloud Service ensures:

- Fewest possible number of electric ignitions.
- Best possible PI regulation.
- An optimized system for your house.
- Lower wood pellet consumption.
- Security in your everyday life.
- The latest updates to the controller.

First Time Start-up

Once the system is assembled, filled with water, connected with power, and supplied with pellets a few basic adjustments to the burner are required. This includes I. Calibrating the external auger by weighing the wood pellets and II. Adjusting the blower setting at 10%, 50%, and 100% power.

I. Weighing the pellets

1. Detach the drop hose from the drop tube on the burner and attach a plastic bag or similar underneath the drop hose *(see image on right.)*

2. Go to the **Manual Control** menu**>External Auger>ON**. This will force start the external auger. Allow for approximately 15 minutes of auger running time. This will ensure that the auger is completely filled and will allow for a more accurate weighing later. Once complete, discard the pellets from the plastic bag and refasten the empty plastic bag to the drop hose.

3. Go to the **Auger** menu**>Balancing>360s** to activate the 360 second test. Wood pellets will begin dispensing.

4. When the test is complete, remove the plastic bag, and weigh only the pellets on a kitchen scale. Enter the weight in the controller by going to the **Auger** menu. **>Auger capacity/6 min>** enter *"pellet weight"*)

II. Adjusting the Blower

1. Turn on the system by pressing the **ON/OFF button** on the controller.

2. Go to the **Regulation** menu> set **Min power**=100% & **Max power**= 100%. This will lock output to 100% power. Allow for 15 minutes for the burner to reach 100% output. *(Note: when locking output to 50% power, set Min & Max power = 50%. Similarly, when locking output at 10%, set Min & Max power=10%)*

3. Take a measurement of either the CO2% or O2% in the chimney using a flue gas analyzer and control that the CO2% or O2% at 100% power are within range to the values shown in the table below.

Power	CO2%	O2%
100%	12-14	7-9
50%	10-8	11-13
10%	6-4	15-17

If the O2% reading is too low, (or similarly if the CO2% is to high) compared to the values on the table, then increase the blower speed to increase the O2% and decrease the CO2% in the combustion. Similarly, to decrease the O2% and increase the CO2%, decrease the blower speed.

To adjust the blower speed, go to the **Fan** menu**>Speed at 100% power** and adjust the blower speed by a few % at a time. Allow for a few minutes for the adjustment to take effect. Take an O2% or CO2% reading and confirm that the values taken are within range to the values shown in the table. *(Note: fan speed at 50% and 10% power can also be found under the Fan menu.)*

4. Repeat steps 1-3 to adjust the blower speed at 50% and 10% power.

5. After adjusting the blower at 100%, 50%, and 10%, go to the **Regulation** menu and set **min power** = 10% and **max power** = 100%. Begin normal operation.

Cleaning the Burner/Boiler

Cleaning should be carried out as needed.
There is a big difference depending on the
construction setup, adjustments and wood pellet quality
on how often maintenance should be performed.

The maintenance table is only indicative and applies only for RTB systems!

When needed	7 Days	14 days	30 days	1/2 annually	1 annually	
x				x		Cleaning cinders out of burner head.
				x		Cleaning under the combustion grate for dust and cinders.
				x		Cleaning photo sensor from soot and dust.
					x	Cleaning burner fan from dust.
x					x	Cleaning boiler and chimney pipe
					x	Emptying the compressor of condensation
x				x		Empty the ash pan, typically after 3000-4000 kg pellets.
x					x	Check gaskets / replace worn gaskets.
x				x		Adjusting the burner. (weighing the pellets)
x	x	x				Filling the hopper.
					x	Emptying the hopper, dust and fines removed.
					x	Chimney sweeper.

Turn off the burner in connection with cleaning.
Turn off the controller and allow to cool for approx. 5 min. Once the burner is completely turned off, it is ready for cleaning. Unplug the burner, remove the shield, drop shaft and remove the burner from the boiler so work can be easily performed.

Boiler/Ash can.
All surfaces inside the boiler must be brushed clean from any deposits and the ash can must be emptied.

Never dispose of hot ashes in the trash, but let it cool in a metal bucket.
Hot ashes can start burning when it gets oxygen (air) .

Burner head.
Remove any ash or cinders from the grate. Remove any pellet remnants under the burner grate. Wipe the photo sensor clean. Ensure that there is nothing lodged in the fan and that it can rotate freely.

RTB Hopper.
The RTB hopper does not need to be cleaned for any dust or debris due to it's special design.

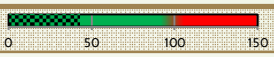
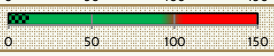
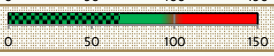
Start-up after cleaning.
Reassemble the system and turn on the controller, the burner will start up automatically.

Remember to reattach the shield so that the temperature reading on the burner is correct.

Service and Maintenance

Proper maintenance of your system reduces the risk of unnecessary downtime.
The controller has inbuilt service indicators that track the use of components and can inform you or your service technician when replacement of component should be performed.
The service indicators provide only an estimated life expectancy of a component or part.
Components can easily have a longer lifetime than suggested by the service indicator.

Note: *It is recommended to have a service audit of your boiler once a year by an authorized dealer/technician in order to prevent unexpected downtime.*

%			Hours	ON/OFF	RESET	DATE
43	External gear		15000	ON	NEJ	31-12-12
35	Internal gear		15000	ON	NEJ	31-12-12
12	Mowing grate gear		10000	ON	NEJ	31-12-12
15	Semi cleaning gear		10000	ON	NEJ	31-12-12
67	Fan		20000	ON	NEJ	31-12-12
112	Igniter		200	ON	NEJ	01-04-12
			Kg			
87	Empty ash container		1000	ON	NEJ	01-12-13
19	Cleaning of semi cleaning		2000	ON	NEJ	31-12-12
25	Cleaning under burning grate		1000	ON	NEJ	31-12-12
50	Cleaning of fan		5000	ON	NEJ	31-12-12

Troubleshooting

We have collected the most typical solutions to small problems.

Problem.	Possible cause.	Possible solution.
Alarm hot drop shaft	Cinders in the burner head.	More air for combustion.
	Back pressure in the boiler.	Clean the boiler etc..
	No draft in the chimney.	Increase the chimney height.
		Clean the burner head regularly.
		Switch to a better quality wood pellets.
Smoke in the hopper.	Ash in the boiler / flue.	Clean the boiler etc..
Smoke setbacks.	No draft in the chimney.	Insolate the smoke pipe.
		Increase the chimney height.
		Submerge a liner in the chimney.
		Increase temperature of the smoke, remove the semi cleaning grates from the boiler.
	Drop shaft sensor defective.	Change temperature sensor on the burner print.
	Unfortunate wind conditions.	Increase the chimney height.
		Close doors, etc..
		Make intake on the same side as the chimney.
Alarm ignition.	Defective ignition.	Replace the electrical igniter with a new one.
	Ignition is located wrong.	Mount it correctly.
	Burner grate is fitted wrong.	Mount it correctly.
	Too high chimney draft.	Install a draft stabilizer in the chimney.
		Set electric ignition power up.
		Reduce the fan speed during ignition.
	Stopped fan.	Check if the fan can run, replace if necessary.
Alarm temperature boiler.	Defective temperature sensor.	Change temperature sensor.
	Temp. sensor fallen off the boiler.	Mount it correctly, attach the sensor with a cable tie.
	Power too low compared to the house.	Make a new adjustment of the burner.
		Adjust the alarm limit down.
		Add more power to the burner if possible.
Alarm motor output.	Fault current on the electric grid.	Supply the burner from another protection group.
	Relay defective.	Send the controller in for repair.
Alarm no fuel.	Hopper is empty.	Fill hopper with wood pellets and restart.
	Flame has gone in operation.	Make a new adjustment of burner.
	Photo sensor is defective.	Change photo sensor with a new one.
	Unstable fuel supply.	Empty auger / hopper for sawdust.
Plug is disconnected.	Burner plug is not fitted.	Insert the plug of the burner.
	Dirt inside the plug to burner.	Clean the plug for pellet dust.
	No connection to the burner print.	Change temperature sensor on the burner print.

Troubleshooting

Problem.	Possible cause.	Possible solution.
Alarm RPM	RPM sensor defective.	Change the fan.
		Change to % regulation at the fan.
No power to the controller.	Defective fuse in the controller.	Replace the fuse to a new one.
	Safety thermostat deactive.	Reconnect by firmly pressing the red button.
	The controller has been over-voltage.	Send controller to NBE for repair.
The burner deactivate residual current protection.	Electric ignition is faulty.	Change the electric ignition to a new.
	Current leak in a component.	Note when RCD deactivate, replace the component.
	Cables exposed.	Check cables, insolate them if possible.
Too high pellet consumption.	Lean burning.	Make a new adjustment of the burner.
	Too high chimney draft.	Install a draft stabilizer in the chimney.
	Uninsulated pipes in the instalation.	Insulate with pipe insulation.
Too many electric ignitions.	Flow in the system is fluctuating.	Set the pressure controlled circulation pump to fixed pressure.
	External thermostat unstable.	Set "External wait" up in the controller.
Un-burnt pellets in the ash can.	Lean burn.	Make a new adjustment of the burner.
	The grate is placed incorrectly.	Mount it correctly.
	Too many pellets on the grate.	Make a new adjustment of the burner.
	The fan is adjusted too high.	Make a new adjustment of the burner.
	Too high chimney draft.	Install a draft stabilizer in the chimney.
Cinders on the grate.	Blower cleaning is not sufficient.	Adjust the fan% up to clean, and the time between the down.
		Clean the grate mechanical more frequently.
	Poor quality pellets.	Change supplier.
		Mount compressor cleaning.
		Change the grate, to a model that is more open.
	Fat combustion.	Adjust the fan up at 10, 50 and 100% power.
		Adjust the burner power down in "auto calculation"
The boiler is condensing.	Too low chimney temperature.	See page 27 about flue gas condensation.

Flue gas condensation

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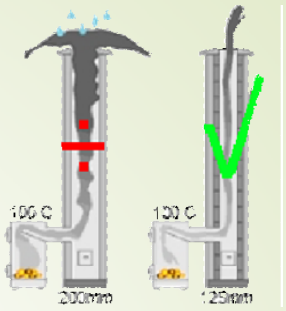
When a boiler has an extremely high efficiency> 93%, the temperature of the flue gas is naturally low. Typical flue loss is only 2-3%. This creates greater demands on your chimney and on how to adapt the boiler to its existing installations. It is important, if you have condensation to prevent it; otherwise you risk developing soot into the chimney and corrosion on the boiler.

Note: *that even if there is water in the boiler it may come from the chimney.*

Things that can prevent condensation in the boiler and chimney.



1. **High chimney >15 ft.**
   Provides a good draft in all conditions.
2. **Small clearing in the chimney 5 in. - 6in.**
   Provides better flow, and can "carry" out more moisture.
3. **Short un-insulated smoke pipe <12 in.**
   Do not cool down the smoke unnecessarily before it reaches the chimney.
4. **Draft stabilizer.**
   Stabilizes the draft, and provides the chimney with dry air.
5. **High boiler temperature >160F degrees.**
   10 degrees up in the boiler temperature gives 10 degrees more smoke temperature.
6. **Suitable return temperature > 130F degrees.**
   If smoke hits boiler surfaces under 117F degrees, it starts condensing.
7. **Heated boiler room.**
   Lowers cooling of the boiler and smoke pipe and provides draft stabilizer more hot air to work with.
8. **More oxygen in combustion.**
   Increases air flow in the boiler, and carries more moisture, 1% more oxygen costs approx. 0.5% in efficiency.
9. **Remove the Turbulators**
   Decreases resistance of the boiler, and get a bad chimney to work better. The gas temperature typically increases to approx. 100 degrees. The burner should be readjusted after the turbulators are removed.
10. **Extend the heating cycle when only running DHW priority**
    During the summertime, it is common to use the DHW priority feature in the controller. If you are noticing condensation in the boiler, a strategy to prevent condensation is to extend the heating cycle by slowing the regulation (PI settings) so as to allow for greater time for the boiler to dry out.
11. **Mount exhaust fan to chimney.**
    Helps the flow the right way, from CHIP 6.82, the exhaust fan can be connected directly to the controller.

Warranty

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The contractor of record is responsible for providing warranty coverage to the customer. In order to maintain warranty coverage, the Kedel RTB must be installed, operated and serviced by a Certified Kedel Partner or Dealer and in accordance with the product manual and conditions outlined herein.

Note: Electrical Igniters are not covered under the warranty as they are a wearable part.

A standard 5-year and 30-year warranty are available for Kedel RTB.

STANDARD WARRANTY: 5-year vessel, 2-year parts

5-year boiler vessel repair or replacement warranty. Parts only.

2-year parts, 1-year labor coverage. 2-year parts warranty does not include the igniter, a wear item.

Conditions of warranty coverage include:

Boiler has been installed and commissioned by an approved installer in accordance with the installation procedures set forth in the product manual. An installation checklist is maintained by the contractor of record.

Boiler has been operated and serviced in a manner consistent with the product manual.

Boiler vessel is warrantied only if damage is due to a manufacturing defect.

Warranty does not cover vessel failure due to weather, flooding, acts of god, fuel quality, back drafting condition, or conditions not related to normal operation and maintenance of the system as defined in the product manual.

Warranty does not cover defects resulting from improper installation and maintenance that causes pre-mature failure. This can include, but is not limited to improper controller settings and improper draft and flu temperatures that cause creosote and condensation in the boiler.

Warranty does not cover damage due to mishandling or improper storage by the approved Partner or Dealer.

Warranty

EXTENDED WARRANTY THROUGH MAINTENANCE AGREEMENT

30-YEAR EXTENDED WARRANTY THROUGH BASIC ANNUAL MAINTENANCE AGREEMENT:
30 Year Vessel Warranty with Standard Parts and Labor Coverage

Under a Basic Maintenance Agreement with an approved Kedel Partner or Dealer, the boiler vessel warranty will be extended to 30 years, parts only. A basic annual service inspection, sufficient to extend the boiler vessel warranty includes the following:

Checking for leaks
Inspection for condensation
Testing emergency functions
Inspecting chimney
Testing draft
Testing combustion
Thorough cleaning of the boiler, including burner head, heat exchanger, ash chamber, etc.
Testing thermal valve for proper function

The Kedel RTB owner is responsible for all regularly-scheduled maintenance including ash removal, regular cleaning of the burner plate (for systems without automatic burner cleaning), as well as for scheduling annual service by a certified Kedel Partner or Dealer. After parts and labor coverage expires, the Kedel owner is responsible for any unscheduled parts failures or maintenance issues that may arise through normal use of the boiler.

WARRANTY CLAIMS

Warranty claims may be made directly to the contractor of record. Interphase Energy, LLC will provide warranty coverage to the certified Partner or Dealer.

Warranty

ACTIVATING AND MAINTAINING THE WARRANTY

The standard Kedel RTB warranty begins at the point of sale to the customer.

The certified Kedel Partner must activate the Kedel RTB warranty within 2 weeks of a completed installation. The information required to activate the warranty includes:

Þ Date of Sale
Þ Retail purchase amount
Þ Boiler serial number
Þ Model
Þ Conveyance and storage system, including capacity, auger length and extraction method
Þ Customer name, address, phone and email
Þ Web monitoring user name and password
Þ Maintenance plan selected by customer
Þ Installation checklist

Warranty may be activated by email. Please send the above information to:

info@kedelboilers.com.

WARRANTY CLAIMS

NOTE: Warranty claims may only be requested by a Certified Kedel Partner or Dealer. In the event that a Partner or Dealer goes out of business, the Customer may contact IE directly regarding warranty coverage.

Þ For each service call or annual maintenance visit during the warranty period, please complete the service checklist included with each boiler. A copy of the checklist should remain with the boiler and a copy with the Partner or Dealer.

Þ For 7 or 10 year extended warranty claims, **Kedel Partners and Dealers must provide consecutive annual service and maintenance checklists** with a warranty claim request. When warranty coverage is requested, please submit by email the following:

Þ Boiler serial number and customer name
Þ All maintenance and annual service checklists as attachments
Þ Annual Maintenance plan, if any
Þ Description of problem
Þ Warranty coverage requested and parts needed

EC DECLARATION OF CONFORMITY

No. : 1701-2014

The undersigned, representing the following manufacturer

Manufacturer : NBE production A/S
address : Kjeldgaardvej 2, DK9300 Saeby, Denmark

or representing the manufacturer's authorized representative established within the Community (or the EEA) indicated hereafter

authorized representative :
address :

herewith declares that the product

Product identification : Pellets Systems: RTB 10, RTB10 VAC RTB 16, RTB16 VAC RTB 30, RTB 30 VAC RTB 40

is in conformity with the provisions of the following EC directive(s)
(including all applicable amendments)

Reference n °	Title
EN 303-5:2012	*Europe Norm*
2006/95-EC	*Low Voltage Directive*
2004/08-EC	*EMC directive (EMCD)*
97/23/EEC	*Pressure Equipment Directive*
2006/42-EC	*Machinery directive*
Arbejdstilsynets bekendtgørelse	*Nr. 612*

and that the standards and/or technical specifications referenced overleaf have been applied.

Last two digits of the year in which the CE marking was affixed: ...14

Jannich Hansen Sæby **13/01/2014**

Jannich Hansen

(signature)

Jannich Hansen, Director

Notes

Date	
Weighing	g
kW low	kW
kW high	kW
Blower low	%
Blower mid	%
Blower high	%
Comments:	

Date	
Weighing	g
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kW high	kW
Blower low	%
Blower mid	%
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Comments:	

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Weighing	g
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Blower low	%
Blower mid	%
Blower high	%
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kW high	kW
Blower low	%
Blower mid	%
Blower high	%
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kW high	kW
Blower low	%
Blower mid	%
Blower high	%
Comments:	